

Confessions of an Environmental Auditor **(or “How to Keep the EPA Away”)!**

Simon Leverton, CEnvP, Senior Manager & Lead Auditor,

EnviroRisk Management Pty Ltd

Ph: 1300 78 44 78

INTRODUCTION

External audits during the lifetime of road construction projects are now accepted practice, no less so than in the area of environmental performance. Public utilities such as Victoria's VicRoads require their contractors to undergo regular (eg. 3 or 6 monthly) external environmental audits as part of the contract specification for the works. The community has become increasingly environmentally aware, and given the highly visible nature of road construction and maintenance works, and their often close proximity to houses and other sensitive locations, effective management of environmental risks is now the expected norm. Road construction and maintenance organisations are now routinely required to develop and implement environmental management and improvement plans to address and mitigate these risks. In addition, regulatory authorities at the State and Federal level continue to maintain an active enforcement role 'in the field', and can impose a range of sanctions against those organisations that fail to comply with environmental standards. The costs of these go far beyond any penalty imposed, and can include additional staff time, clean up costs, re-work, damage to reputation, etc.

Over a number of years the author has conducted numerous external environmental audits of road construction works for VicRoads and for construction contractors directly. The duration of these audits has for the most part been 0-5-1.0 days on site, with approximately 2/3rd of that time spent interviewing personnel and reviewing documentation, and the balance taken up with an accompanied inspection of the works and site compound. For very large complex projects, such as the multi-site Airport Link project, these audits have taken up to 2 weeks to conduct, including both review of documentation, interviews with site personnel, and site inspections.

This paper draws from the author's auditing experiences, and without identifying any particular project, sets out some of the key issues that road construction and maintenance contractors need to focus on in order to improve their environmental performance and ensure visits from their local EPA are always positive ones!

DOCUMENTATION

Typically, contractors develop an overarching environmental management system (EMS) that will cover all projects likely to be encountered. Some contractors have obtained certification of their EMS to the Australian Standard AS/NZS ISO14001:2004. Procedures

will be generic, and it is intended that for each project a review of the applicable environmental aspects, or risks, takes place prior to the works, and the relevant procedures are referenced for that project. In the case of VicRoads' tenders, for non-major works an initial environmental impact assessment is conducted by VicRoads (often with input from expert consultants). Where particular site-specific risks have been identified during the pre-works assessment some projects may carry with them requirements that are out of the ordinary, such as pre-works monitoring for noise/vibration, or instantaneous dust monitoring using mobile equipment. These need to be 'captured' in EMS procedures for that project to ensure conditions and requirements are known and complied with.

For example, the set up and use of portable dust monitoring equipment, such as the DUSTTRAK™ monitor, requires some technical ability by site personnel (Figure 1). This piece of equipment is a valuable real-time reactive management tool, but if used incorrectly



Figure 1. DUSTTRAK™ portable dust monitor. Non-ideal mounting configuration.

may quickly lead to unacceptable off-site impacts going undetected. Procedures need to clearly state how and where equipment is to be established and operated (or at least refer to a clearly-written guidance manual), and how the data obtained is to be recorded, interpreted and acted on. Personnel also need to be trained in the correct set-up and operating techniques. Where emission limits are specified in the Project Contract (or elsewhere such as State legislation) these should be clearly reproduced in the procedure.

The response action to be taken when limits are breached should also be spelled out in the procedure, including the need to raise an incident report.

Critical to the success of any environmental monitoring program is the clear understanding by those involved of the importance of obtaining reliable and representative data, and interpreting the data correctly. The author has frequently found that environmental quality monitoring data, whilst obtained, is not being routinely reviewed, interpreted and acted on where exceedences occur. Examples include the use of:

- dust deposition monitoring data, and
- water quality monitoring data.

Dust deposition monitoring measures the dust deposited in collection gauges over a period of 2 weeks or 1 month (depending on the contract requirement). The gauges are located between areas of high work intensity and nearby dust-sensitive places such as houses or schools. An exceedence will occur if the dust collected exceeds a specified limit, or it exceeds by a specified amount the dust collected in another gauge located away from the works site (considered to represent the background level of dust in the neighbourhood). Whilst the data obtained are retrospective, representing a situation that is long past (or as one wag auditee put it wryly, "it's all done and dusted!"), they can nonetheless provide some measure of the success of the management efforts taken during the monitoring period, and

therefore help inform the types of mitigation measures to be taken in future. In any event, exceedences need to be recorded as incidents and investigated to determine the most likely explanation for the exceedence – this is frequently not being done by contractors.

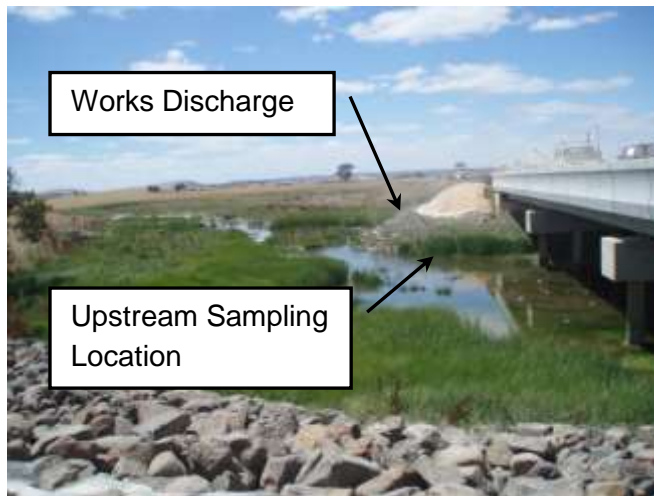


Figure 2. Sampling location is not representative - upstream water quality impacted by works.

Water quality monitoring is usually done in waterways that run through a works site, with samples taken up and downstream of the works. The quality of water downstream of the works site should not be worse than upstream (which is taken as 'background'), although sometimes downstream quality limits not-to-be-exceeded are also specified in contract conditions. Sampling locations need to be chosen carefully to ensure they provide access to representative samples. The

upstream sampling location should enable the sampling of water that is not impacted by the works, and will

not be impacted by some other extraneous activity immediately prior to it crossing the works site. As with dust monitoring, the data collected should be reviewed, and all exceedences noted and investigated. Where *in situ* monitoring is being conducted, the person doing the monitoring should be aware of any exceedence and should take action at that time. This might involve reporting the exceedence to a supervisor, checking that sediment controls are working properly on the site, and determining whether additional controls may be immediately needed. An incident report should be completed for all exceedences.

SITE PRACTICES

Dust and Sediment Run-off

Whilst road construction and maintenance projects may vary according to their size, location, duration, etc., in most cases the recurrent highest risk environmental issues are usually dust, and waterway pollution from sediment-laden run-off. There is a range of measures that can be employed to mitigate dust – one of the most effective and now almost universally used is watering with purpose-built watering trucks. Where possible non-potable water is preferred, however its use requires



Figure 3. Water truck in action.

some precautions. Non-potable water may come from a variety of sources, including treated sewage plant effluent, farm dams, or quarry pits. Misuse could result in off-site environmental impacts, or have OH&S implications. VicRoads requires its contractors to develop a management plan for the use of non-potable water, and has published guidelines to assist in the preparation of a plan. The plan should address matters such as confirming suitable water quality through sampling and analysis, using labels or signs to clearly

designate non-potable water storage tanks on site (if in use), and the training and awareness of all personnel involved in its use.

Other dust prevention and suppression measures include hydromulching, allowing areas to self-seed, erecting geotextile wind breaks, and the use of additives in water spray. In the latter case, one contractor reported achieving a good result for stockpiles and other non-trafficked areas using a water spray additive extracted from orange peel. When the water dried out it left a surface crust, and a slight but pleasant aroma as a bonus! Some manufacturers claim to supply environmentally friendly additives, but their composition needs to be checked to ensure the cure won't be worse than the disease. During a heavy rain event large areas of exposed soil on a road works site can generate a significant volume of sediment-polluted run-off. Effective erosion and sediment control measures are vital in protecting waterways from the impacts of this polluted water run-off. A variety of measures can be used, ranging from silt fences, sedimentation ponds, rock beaching and the use of geofabric matting. The measures need to be used appropriately, and correctly installed, and there are detailed guidelines published by the Victorian EPA and other organisations (eg. Civil Contractors Federation's *Best Practice Guidelines*) which should be referred to for assistance. Given the dynamic nature of road construction sites, and the temporary nature of these measures, regular checking for correct installation (i.e. daily), and re-evaluation of the number and type of controls in place, needs to occur as the project progresses. "Inadequate, or improperly installed, sedimentation control devices" is a significant finding in most environmental audits of road construction works.

Vehicle Refuelling

Vehicle refuelling represents a potential environmental risk with significant consequences. Contracts often require dedicated refuelling locations, sited at least 20m away from drainage lines or waterways. These must be marked on plans, and communicated to all relevant personnel, including sub-contractors. Where bulk fuel (i.e. quantities greater than 50L) is stored on site, this must be in a suitably bunded area, with an appropriately sized and well-stocked spill kit nearby. Mobile refuelling vehicles must carry stocked spill kits (do you include these in your daily checks?) and not perform refuelling operations within 20m of waterways. Don't believe the subbie who says he's never had a spill – he's probably next on fate's list! Mobile fuel containers should be purpose-designed for the job, and not make-shift or jury-rigged devices (eg. Figure 8).



Figure 8. A fuel spill waiting to happen!

In summary, the author continues to unearth instances where construction contractors have failed to incorporate contract environmental conditions into their documentation and work practices – each new contract needs to be carefully reviewed before work commences to ensure existing EMS documentation has ‘captured’ all requirements.

Compliance Monitoring Tools

For managers of multiple sites having a variety of compliance requirements, tablet or iPad-based management software could help to keep on top of an organisation’s compliance status. One such package that has been developed and trialled by EnviroRisk (ComplySure™) was originally conceived with local government in mind, but is also readily transferable to road construction or other multi-site environmental compliance management situations. Personnel carrying out monitoring activities, such as water testing, site inspections, or other compliance evaluations simply enter the data into their laptop, iPad or similar. The data is instantly available to a ‘remote’ manager through cloud functionality. The software can be configured to:

- alert when tasks are to be performed,
- show historical data in graphical form, and therefore identify trends, and
- alert the manager where a non-compliance is recorded, enabling immediate action to be requested.

The environmental compliance status across all sites can also be displayed in real time, useful for presentation at management meetings.

As our understanding of the environment and how best to protect it increases, environmental compliance will continue to be a moving feast. Attention to detail with your environmental management documentation, training and staff awareness, and on-the-ground mitigation measures (particularly for those high risk issues) will help make sure your next encounter with the EPA is pleasant and positive.

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